“CONTRIBUTION TO ASSESSMENT OF FRACTURE RESISTANCE OF CORE BUILD UP MATERIALS ON ENDODONTICALLY TREATED TEETH WITH SPECIAL REFERENCE TO MECHANICAL PROPERTIES OF FOUR RECENT RESIN BASED DIRECT CORE BUILD UP MATERIALS”

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ABSTRACT

Root Canal Treatment (RCT) is one of the most common conservative treatment practiced nowadays in the field of endodontics. After RCT, a major concern for the practitioner as well as the patient is the coronal restoration of the tooth which is also one of the main parameters which influence the prognosis of the tooth. Functionality of the tooth is the emerging concept these days rather than healing. This study aims to review and update the current knowledge about the clinical approach to be followed in restoring endodontically treated teeth by finding the best material for core build up in terms of strength.

For this purpose, a thorough study of the available literature was made regarding the materials used as core build up materials so far in dentistry. These materials were cast gold, amalgam, Glass Ionomer Cement (GIC), and composite resins of many types, each material having some pros and cons. From this review, the newly introduced flowable composite resins such as Para Core, Luxacore Z Dual, Flourocore, and Multi Core seemed to be the best option for restoring teeth after endodontic treatment. Hence, they were selected to be the materials to be used in this study.
Strength is an important factor for the durability of any restoration because teeth are always subjected to masticatory forces, hence the mechanical properties of core build up materials should be the main element taken into consideration.

In order to test these properties of the aforementioned flowable composites, the study design was conceptualized as described.

These materials were individually manipulated according to manufacturer’s instructions. Three hundred specimens were made and divided into four groups of seventy five samples of each of the four materials divided into three subgroups of twenty five each for testing compressive, tensile and flexural strength respectively. Then the same materials were used for core build up on one hundred root canal treated extracted teeth (twenty five teeth of each material) to simulate the conditions in the oral cavity and were subjected to load in order to obtain the fracture resistance to test the strength. Such a large number of samples was used to study the variation minutely.

Posts are generally used along with cores for better strength, so following the concept of monobloc configuration where the tooth, post and core are regarded as a single unit, the glass fiber posts which are best suited for esthetic reasons as well as flexibility were chosen to be used on the teeth before core build up. A Universal testing machine which is generally used for testing strength of different materials was used in this study and readings obtained in each group.

All the obtained readings were then tabulated and subjected to statistical analysis for comparison in each group and among groups. For this purpose, statistical tools such as ANOVA (one factor analysis of variance), Shipro-Wilk’s test, Levene’s test and Bonferroni’s test were used.
The results indicated that Para Core was the best material in terms of compressive and tensile strength whereas flexural strength of Luxacore Z Dual was found to be superior followed by Para Core. Fracture resistance of Para Core was the highest in the second part of the study. Comparing these results, it was confirmed that Para Core was the material of choice among the flowable composite materials in clinical practice.

This study adds a concrete evidence to the existing literature regarding the sturdiest core build up material and opens a way to future research on flowable composites in terms of other properties such as esthetics, microleakage, bond strength, dimensional stability and many more.

………………………..“Taking a step ahead is the right way for research”